

## THE CLAIMS

What is claimed is:

1. A method for providing access to a communications medium, the communications medium being suitable for allowing use of a plurality of Home Phoneline Network Association (HPNA) v2 frames, each HPNA v2 frame being timed to allow a plurality of physical layer priority level slots, the method comprising steps of:

maintaining a list of sessions in enhanced stations (STAs) using the communications medium, each enhanced STA being one of a Media Control Station (MC STA) and a non-Media Control Station (non-MC STA) and gaining access to the communications medium in a centralized manner;

transmitting at least one first message from the MC STA to at least one selected non-MC STA using the communications medium, the transmitted message being transmitted with a highest physical layer priority level available in an HPNA v2 frame; and

transmitting at least one second message from at least one selected non-MC STA in response to a first message during the same HPNA v2 frame.

2. The method according to claim 1, wherein at least one second message is transmitted to the MC STA.

3. The method according to claim 1, wherein at least one second message is

transmitted to another non-MC STA.

4. The method according to claim 1, wherein the step of transmitting a second message transmits at least a portion of the second message simultaneously with the step of transmitting the first message.

5. The method according to claim 1, wherein at least a portion of at least two second messages are transmitted simultaneously with each other.

6. The method according to claim 1, wherein the highest physical layer priority level slot available in the HPNA v2 frame is a PRI 7 slot of the HPNA v2 frame.

7. The method according to claim 1, wherein the first message is one of a polling frame, a beacon frame, a Centralized Contention (CC) frame, and a management frame.

8. The method according to claim 7, wherein when the first message is a management frame that includes a Medium Allocation Element (MAE).

9. The method according to claim 9, wherein the management frame is a Beacon frame.

10. The method according to claim 7, wherein the transmitted message is a CC frame,

the method further comprising a step of providing a predetermined period of time subsequent to the CC frame for at least one reservation request (RR) frame to be transmitted.

11. The method according to claim 7, wherein the transmitted message is a CC frame,

the method further comprising a step of transmitting a blocking signal subsequent to transmitting the CC frame.

12. The method according to claim 7, wherein the transmitted message is a CC frame,

the method further comprising a step of transmitting at least one reservation request (RR) frame in response to the CC frame.

13. The method according to claim 1, wherein the first message includes a Medium Allocation Packet (MAP) for a plurality of non-MC STAs, the MAP including information relating to one of a specific time period assigned to each of the plurality of non-

MC STAs, an order for each of the plurality of non-MC STAs to use the communications medium, an order for transmissions for each of the plurality of non-MC STAs, and a maximum time for each of the plurality of non-MC STAs to occupy the communications medium.

14. The method according to claim 1, wherein the frame in which the first message is transmitted has an associated Inter-Frame Gap (IFG) that has a duration that is less than about 17  $\mu$ sec.

15. A method for providing access to a communications medium, the communications medium being suitable for allowing use of a plurality of Home Phoneline Network Association (HPNA) v2 frames, each HPNA v2 frame being timed to allow a plurality of physical layer priority level slots, the method comprising steps of:

maintaining a list of sessions in enhanced stations (STAs) using the communications medium, each enhanced STA being one of a Media Control Station (MC STA) and a non-Media Control Station (non-MC STA) and gaining access to the communications medium in a centralized manner;

transmitting at least one first message from the MC STA to at least one selected non-MC STA using the communications medium, the first message being transmitted with a highest physical layer priority level available in an HPNA v2 frame; and

receiving at least one second message from at least one selected non-MC STA in response to a first message during the same HPNA v2 frame.

16. The method according to claim 15, wherein the step of receiving a second message receives at least a portion of the second message simultaneously with the step of transmitting the first message.

17. The method according to claim 15, wherein the highest physical layer priority level slot available in the HPNA v2 frame is a PRI 7 slot of the HPNA v2 frame.

18. The method according to claim 15, wherein the first message is one of a polling frame, a beacon frame, a Centralized Contention (CC) frame, and a management frame.

19. The method according to claim 18, wherein when the first message is a management frame that includes a Medium Allocation Element (MAE).

20. The method according to claim 19, wherein the management frame is a Beacon frame.

21. The method according to claim 18, wherein the first message is a CC frame, the method further comprising a step of providing a predetermined period of time subsequent to the CC frame for receiving at least one reservation request (RR) frame.

22. The method according to claim 18, wherein the first message is a CC frame, the method further comprising a step of transmitting a blocking signal subsequent to transmitting the CC frame.

23. The method according to claim 18, wherein the first message is a CC frame, the method further comprising a step of receiving at least one reservation request (RR) frame in response to the CC frame.

24. The method according to claim 15, wherein the first message includes a Medium Allocation Packet (MAP) for a plurality of non-MC STAs, the MAP including information relating to one of a specific time period assigned to each of the plurality of non-MC STAs, an order for each of the plurality of non-MC STAs to use the communications medium, an order for transmissions for each of the plurality of non-MC STAs, and a maximum time for each of the plurality of non-MC STAs to occupy the communications medium.

25. The method according to claim 15, wherein the frame in which the first message is transmitted has an associated Inter-Frame Gap (IFG) that has a duration that is less than about 17  $\mu$ sec.

26. A method for providing access to a communications medium, the communications medium being suitable for allowing use of a plurality of Home Phoneline Network Association (HPNA) v2 frames, each HPNA v2 frame being timed to allow a plurality of physical layer priority level slots, the method comprising steps of:

receiving at least one first message from a Media Control Station (MC STA) at a non-Media Control Station (non-MC STA), the MC STA maintaining a list of sessions in enhanced STAs using the communications medium, each enhanced STA being one of the MC STA and a non-MC STA and gaining access to the communications medium in a centralized manner, the received message being received with a highest physical layer priority level available in an HPNA v2 frame; and

transmitting at least one second message to at least one enhanced station in response to the first message during the same HPNA v2 frame.

27. The method according to claim 26, wherein at least one second message is transmitted to the MC STA.

28. The method according to claim 26, wherein at least one second message is transmitted to another non-MC STA.

29. The method according to claim 26, wherein the step of transmitting a second message transmits at least a portion of the second message simultaneously with the step of receiving the first message.

30. The method according to claim 26, wherein the step of transmitting at least one second message includes a step of transmitting a second message from at least two non-MC STAs, at least a portion of at least two second messages being transmitted simultaneously with each other.

31. The method according to claim 26, wherein the step of receiving a second message receives at least a portion of the second message simultaneously with the step of receiving the first message.

32. The method according to claim 26, wherein the highest physical layer priority level slot available in the HPNA v2 frame is a PRI 7 slot of the HPNA v2 frame.

33. The method according to claim 26, wherein the transmitted message is one of



a polling frame, a beacon frame, a Centralized Contention (CC) frame, and a management frame.

34. The method according to claim 33, wherein when the first message is a management frame that includes a Medium Allocation Element (MAE).

35. The method according to claim 34, wherein the management frame is a Beacon frame.

36. The method according to claim 33, wherein the first message is a CC frame, the method further comprising a step of providing a predetermined period of time subsequent to the CC frame for receiving at least one reservation request (RR) frame.

37. The method according to claim 33, wherein the first message is a CC frame, and wherein a blocking signal is transmitted subsequent to transmitting the CC frame.

38. The method according to claim 33, wherein the first message is a CC frame,

the method further comprising a step of transmitting at least one reservation request (RR) frame in response to the CC frame.

39. The method according to claim 26, wherein the first message includes a Medium Allocation Packet (MAP) for a plurality of non-MC STAs, the MAP including information relating to one of a specific time period assigned to each of the plurality of non-MC STAs, an order for each of the plurality of non-MC STAs to use the communications medium, an order for transmissions for each of the plurality of non-MC STAs, and a maximum time for each of the plurality of non-MC STAs to occupy the communications medium.

40. The method according to claim 26, wherein the frame in which the first message is received has an associated Inter-Frame Gap (IFG) that has a duration that is less than about 17  $\mu$ sec.

41. A communications network having a communications medium, the communications medium being suitable for allowing use of a plurality of Home Phoneline Network Association (HPNA) v2 frames, each HPNA v2 frame being timed to allow a plurality of physical layer priority level slots, the communications network comprising:

a Media Control Station (MC STA) maintaining a list of sessions in enhanced

stations (STAs) using the communications medium, each enhanced STA being one of the MC STA and a non-Media Control Station (non-MC STA) and gaining access to the communications medium in a centralized manner, the MC STA transmitting a first message to at least one selected non-MC STA using the communications medium, the first message being transmitted with a highest physical layer priority level available in an HPNA v2 frame, at least one non-MC STA coupled to the communications medium, the non-MC STA transmitting at least one second message in response to a first message during the same HPNA v2 frame.

42. The communications network according to claim 41, wherein at least one second message is transmitted to the MC STA.

43. The communications network according to claim 41, wherein at least one second message is transmitted to another non-MC STA.

44. The communications network according to claim 41, at least a portion of the second message is transmitted simultaneously with the first message.

45. The communications network according to claim 41, wherein at least a portion of at least two second messages are transmitted simultaneously with each other.

46. The communications network according to claim 41, wherein the highest physical layer priority level slot available in the HPNA v2 frame is a PRI 7 slot of the HPNA v2 frame.

47. The communications network according to claim 41, wherein the first message is one of a polling frame, a beacon frame, a Centralized Contention (CC) frame, and a management frame.

48. The communications network according to claim 47, wherein when the first message is a management frame that includes a Medium Allocation Element (MAE).

49. The communications network according to claim 49, wherein the management frame is a Beacon frame.

50. The communications network according to claim 47, wherein the transmitted message is a CC frame, and

wherein a predetermined period of time is provided subsequent to the CC frame for at least one reservation request (RR) frame to be transmitted by a non-MC STA.

51. The communications network according to claim 47, wherein the transmitted message is a CC frame, and

wherein a blocking signal is transmitted on the communications medium subsequent to the CC frame.

52. The communications medium according to claim 47, wherein the transmitted message is a CC frame, and

wherein at least one reservation request (RR) frame is transmitted by a non-MC STA in response to the CC frame.

53. The communications medium according to claim 41, wherein the first message includes a Medium Allocation Packet (MAP) for a plurality of non-MC STAs, the MAP including information relating to one of a specific time period assigned to each of the plurality of non-MC STAs, an order for each of the plurality of non-MC STAs to use the communications medium, an order for transmissions for each of the plurality of non-MC STAs, and a maximum time for each of the plurality of non-MC STAs to occupy the communications medium.

54. The method according to claim 41, wherein the frame in which the first message is transmitted has an associated Inter-Frame Gap (IFG) that has a duration that is

less than about 17  $\mu$ sec.

55. A Media Control Station (MC STA) for a communications network, the communications network having a communications medium that is suitable for allowing use of a plurality of Home Phoneline Network Association (HPNA) v2 frames, each HPNA v2 frame being timed to allow a plurality of physical layer priority level slots, the MC STA comprising:

a QoS management entity (QME) receiving at least one end-to-end QoS message characterizing a user application, the at least one end-to-end QoS message including at least one QoS parameter set that is expressed at a layer that is higher than the Media Access Control (MAC) sublayer of an HPNA v2 network and is to be passed down to the MAC sublayer of the MC STA for enabling QoS traffic transport of the application; and

an admission control entity (ACE) performing an admission control decision relating to the application based on the at least one end-to-end QoS message characterizing the application,

the MC STA transmitting at least one first message from the MC STA to at least one selected non-Media Control Station (non-MC STA) using the communications medium, the first message being transmitted with a highest physical layer priority level available in an HPNA v2 frame, and receiving at least one second message from at least one selected non-MC STA in response to a first message during the same HPNA v2 frame.

56. The MC STA according to claim 55, wherein at least a portion of the second message is received simultaneously when the first message is transmitted.

57. The MC STA according to claim 55, wherein the highest physical layer priority level slot available in the HPNA v2 frame is a PRI 7 slot of the HPNA v2 frame.

58. The MC STA according to claim 55, wherein the first message is one of a polling frame, a beacon frame, a Centralized Contention (CC) frame, and a management frame.

59. The MC STA according to claim 58, wherein when the first message is a management frame that includes a Medium Allocation Element (MAE).

60. The MC STA according to claim 59, wherein the management frame is a Beacon frame.

61. The MC STA according to claim 58, wherein the first message is a CC frame, and

wherein a predetermined period of time is provided subsequent to the CC frame for receiving at least one reservation request (RR) frame.

62. The MC STA according to claim 58, wherein the first message is a CC frame, and  
wherein a blocking signal is transmitted subsequent to transmitting the CC frame.

63. The MC STA according to claim 58, wherein the first message is a CC frame, and  
wherein the MC STA receives at least one reservation request (RR) frame in response to the CC frame.

64. The MC STA according to claim 55, wherein the first message includes a Medium Allocation Packet (MAP) for a plurality of non-MC STAs, the MAP including information relating to one of a specific time period assigned to each of the plurality of non-MC STAs, an order for each of the plurality of non-MC STAs to use the communications medium, an order for transmissions for each of the plurality of non-MC STAs, and a maximum time for each of the plurality of non-MC STAs to occupy the communications medium.



65. The method according to claim 55, wherein the frame in which the first message is transmitted has an associated Inter-Frame Gap (IFG) that has a duration that is less than about 17  $\mu$ sec.

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